Journal of Livestock Science and Production
p-ISSN 2598-2915
e-ISSN 2598-2907

Volume 4 No. 1
March 2020

Case Study on Genesis Infectious Bursal Disease (IBD) on Broiler chickens at PT. Aretha Nusantara Farm Bandung

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Abstract

Infectious Bursal Disease (IBD) known as *Gumboro* is a high frequently found virus that has an acute trait. It occurs on broiler chickens and easily transmitted among them especially during the maintenance period. The targets of this virus are the cell in the bursa of fabricius and various lymphoid organs. Therefore, the IBD virus infection causes interference to the immune system. Moreover, the observation of clinical symptoms showed that in the Arjasari 2 stall found the changes in clinical symptoms on broiler chickens. It covers weakness and lethargy, decreased appetite, hanging wings, whitish watery diarrhea, and dirty cloaca. Besides, during the maintenance period found a high mortality rate. Based on the results of a necropsy, several organs have changed in broiler chickens aged 17-33 days. Changes in the bursa of fabricius experiencing organ hemorrhage air sacs that become inflamed (airsacculitis), and hemorrhages on the heart, thus space indicating an IBD. Results from the study showed that the field methods for diagnosis with a view of the clinical symptoms, the mortality rate, and a necropsy can be used as a method for the field diagnosis of IBD. Changes in the post mortem organ can be used as reinforcement to the clinical diagnosis of IBD, especially changes or damage to the bursa of fabricius.

Keywords : *Infectious Bursal Disease* (IBD), broiler chicken, necropsy, diagnosis

Introduction

Infectious Bursal Disease (IBD) also known as *Gumboro* disease is a high frequently found disease that has acute trait on broiler chickens (Tabbu, 2000). The targets are the cell in the bursa of Fabricius and various lymphoid organs. Therefore, the virus infection can cause suppression to the infected broiler chickens' immune system (Lukert and Saif, 2003).

Problems often occur in broiler chickens is the emergence of a disease. One of the diseases that attack broilers is IBD. The pattern of development has increased significantly. Based on the data, it often strikes during 2018 and early 2019, the IBD ranks second in broiler chickens. Prevalence arises from IBD in broiler chickens at 12.5%. It is mostly found in broiler chickens. IBD virus infection is significant importance in the poultry industry because it can cause high morbidity rates, varying between 10-90% and the mortality reached 20%, impaired growth, rising costs of drug use, and disinfectant (Tabbu, 2000). IBD is a major problem for farmers and communities. Because IBD disease causes high mortality in chickens and will certainly result in many losses for farmers (Lukert and Saif, 2003).

Rooted in observations made in the field is quite difficult to distinguish between the cases of IBD with Inclusion Body Hepatitis (IBH). This is because changes in anatomical pathology and clinical symptoms

are relatively similar. This causes an error when the diagnosis of a disease in chickens. Therefore, we need a method of diagnosing a disease quickly and precisely.

To improve the productivity of broiler chickens, its maintenance should be improved first. One that can be performed is to improve on the health broiler chickens sector. IBD becomes one of the diseases that needed to be alert. Therefore, an easy and quick accurate method diagnosis is needed. The benefits of a quick and accurate diagnosis are it can be used as a reference and guide for the next step, to give better treatment to the disease.

Material and Method

Time and place

The research was conducted from September 1 to October 14, 2018. The research in commercial broiler chicken farm PT. Aretha Nusantara Farmstall 2 Arjasari, Arjasari sub-district, Bandung regency, West Java.

Tools

The tools used in this research that includes a syringe size of 10 ml for the euthanasia process, a set of surgical instruments for necropsy is like scissors, scalpel, anatomical tweezers, knives, sacks, mask, gloves, and a camera.

Material

Materials used in this research that broiler chickens are taken randomly at 2 Arjasari stalls downstairs and upstairs are broiler chickens aged 17-33 days, and water.

Data retrieval

The method used in this study is the primary and secondary data collection. The collection of primary data includes a necropsy (surgical carcass) and the recording. Secondary data collection is gathered through tracking the animal's medical record, discussion session with the stall operator, and observation on the physical condition of the chicken looks from the outside in general (anamnesis).

Procedures and Observation Parameter

A sampling of broilers is taken randomly in stall 2 Arjasari aged 17-33 days as much as 5 chickens in living conditions, from several populations, is about 48,000 chickens (divided into two pens with the same number of chicken). Observation of clinical symptoms is made directly in the field to see some clinical changes that occur in broiler chickens. Necropsy is an anatomic pathology examination carried out without the aid of laboratory examination. Before the necropsy, firstly observe the general state of the chicken starts from the skin, abnormal forms found in chicken, wattle, and the state of the eyes. Necropsy performed using the tools and materials that have been prepared using the following procedure:

1. Prepare five live broiler chickens and necropsy equipment.

2. The euthanasia process is made by inserting air into the chest precisely in the heart of a live chicken directly until death.
3. Chicken broiler laid on the pedestal with the position of the back under and supine body position, then make a transverse incision in the peritoneum wall.
4. Observe the pectoral muscle and check the airbag is there a change of color.
5. Observe the abdomen and chest cavity is there may be fluid, exudate, transudate, or blood.
6. Secrete digestive tract by cutting esophagus in the proximal proventriculus, check bursa of Fabricius to specific abnormalities. Furthermore, the heart, liver, gall bladder, and spleen removed for examination (reviewing lesions in organs).
7. Make an incision on the left side of the mouth, into the pharynx, and ingluvies then observe any abnormalities in those organs.
8. Observe and record all pat found at the time of necropsy (surgical carcass).

mortality is calculated with the following formula:

$$\text{Mortality} = \frac{\text{Number of death chicken}}{\text{Total number of chicken}} \text{x } 100\%$$

Data analysis

Data obtained from primary and secondary data, then compared with the literature and concluded to get a diagnosis.

Results and Discussion

Clinical symptoms Changes In Broiler Chickens

In stall 2 Arjasari, there were changes in clinical symptoms which occur in broiler chickens aged 17-33 days. Those changes include: weak and lethargic, decreased appetite, hanging wings, whitish watery diarrhea, and dirty cloaca (Figure 1). The clinical symptoms that appear were suspected of the infectious bursal disease. Accordance with the opinion of Park et al., (2009) stated that the clinical symptoms caused by infection with IBD are chicken lethargy, appetite disappeared and wing hanging. This is reinforced by the opinion Tabbu (2000) stated that the initial symptoms that look like a chicken pecking tendency into the cloaca and surrounding area. These symptoms will be followed by whitish watery diarrhea, the cloacal area was dirty, standing feathers, tremor (shaking), very weak, and ended with the death (Figure 2).

Figure 1. The chicken looks weak and lethargic

Figure 2. Whitish Watery Diarrhea

Moreover, the maintenance of this period was found the unnatural high mortality rate. Mortality is the death rate of the total population of an animal. Percentage mortality in PT. Aretha Nusantara Farm can be seen in Table 1.

Table 1. The mortality rate of broilers in PT. Aretha Nusantara Farm

Age (days)	Population (chicken)	Chickens death (chicken)	Chicken death/day (chicken)	Mortality (%)	Mortality (%/day)
1 - 7	48,000	204	29	0,42	0,06
8 - 14	47,796	177	25	0,37	0,05
15 - 21	47,619	360	51	0,75	0,11
22 - 28	47,259	656	94	1,38	0,20
29 - 33	46,603	9488	1355	20,35	2,91
Average		2177	311	4,65	0,66

Source: PT. Aretha Nusantara Farm Bandung

Table 1 shows that the mortality in the first week to the third week is still in a reasonable state. The average mortality of about 0.51%. However, entering the fourth week of broilers increased mortality, then the fifth week increased mortality was very high, reaching 20.35%. According to Tabbu (2000) mortality due to Gumboro which is not followed by a secondary infection can reach 20% - 30%.

Mortality in the first week to the third week is possibly happened because of the bad handling management. It was found the existence of a leak nipple which causes husk to become damp and wet. It makes the levels of ammonia in a stall to be high so that the air cannot go out well. It causes broilers to suffer panting.

In the fourth week, mortality was increased, high mortality in this week indicated because of a disease that attacks the immune system in broiler chickens. In the fifth week mortality increased significantly, it is presumably because the chicken is infected by a virus. A disease that attacks the immune system causes the immune system does not form so that the maximum possible secondary infections will be easier to attack the chicken. Tanimura et al. (1995) stated that IBD disease attacks chickens aged 3-6 weeks when the optimal development of the Fabricius has been reached. At the same time, maternal antibodies begin to decrease, it causes chickens are vulnerable to IBD virus infection. In contrast, IBD disease is not harmful to chickens that have undergone fabricius bursa regression, because the target cell for IBD virus infection is lymphoid bursa fabricius cells. According Kusnadi

(2006) the magnitude of the mortality rate is influenced by several factors, namely disease, body weight, ambient temperature, and environmental hygiene.

Changes in Post Mortem Organ in Broiler Chickens

Changes to post mortem organ in broiler chickens can be observed by performing a necropsy. Necropsy is a way or method to perform a quick and precise examination in determining a diagnosis in broiler chickens caused by an illness or death of an animal. Post mortem examination carried out if it is found an increase in the mortality rate that occurred in broiler chickens. Necropsy should be performed immediately before the carcass is damaged (autolysis) after the death of an animal.

Necropsy is quite important and also useful to do in broiler chickens farm. Because by doing a necropsy we can determine the post mortem organ damage that obtained from a disease or parasite that attacks in broiler chickens. This is reinforced by the opinion Dharma and Son (1997) stated that if there were multiple deaths in chickens in the field, it takes a rapid diagnosis and appropriate. Therefore necropsy examination is a very important technique in determining the diagnosis of a disease. Diagnosis of the disease is highly dependent on the knowledge and information about a variety of things about the history of the disease, clinical symptoms, changes in post mortem, and other laboratory tests.

Necropsy not only easy to do but also efficient. Before performing a necropsy, chickens examined first from the outer body covering the state of the eye, wattle, the state of the dirty cloaca, and other body parts. The results of a necropsy are shown in Table 2.

Table 2. Abnormality In Broiler Organ Aged 17-33 days

No.	Organ name	Changes in Anatomical Pathology
1	Bursa of fabricius	There is hemorrhage in the bursa of fabricius
2	*Airsacc*	There airsacculitis
3	Heart	There is hemorrhage in the heart

Source: PT. Aretha Nusantara Farm

Post mortem changes include hemorrhage on the bursa of fabricius 17 days (Figure 3), hemorrhage on the bursa of fabricius at the age of 33 days (Figure 4), airsacculitis (Figure 5) cardiac hemorrhage (Figure 6). Based on Figure 3 and 4 there is a change in the bursa of fabricius experiencing organ hemorrhage. Hemorrhage that occurs at the age of 33 days was greater than 17 days. If the bursa of fabricius is bleeding or running into severe damage, the broiler chickens' immune will be damaged as well. Therefore, the broiler chicken will be more susceptible to various diseases.

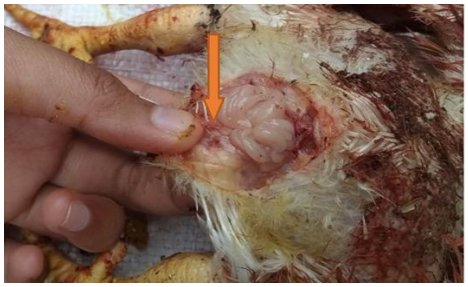

Figure 3. Hemorrhage on bursa of fabricius broilers aged 17 days

Figure 4. Hemorrhage on the bursa of fabricius broilers aged 33 days

This is following the opinion of Syibli et al., (2008) IBD is an acute infectious disease in chickens, characterized by severe inflammation on the bursa of fabricius and immunosuppressive which caused the collapse of the immune system of broilers resulting decline in response to the chicken to the vaccination and the chicken becomes more susceptible to other pathogens.

Damage and hemorrhage on the bursa of fabricius happened in broiler chickens at the age of 17-33 days. So the necropsy results lead to the possibility of IBD occurs in middle age. This is by the opinion Tabbu (2000) suggested that the incidence of IBD is divided into two forms, namely early infection ie at 1-21 day old chicks and delayed infection in chickens aged 3 weeks and over.

Figure 5. Airsacculitis in broiler chicken aged 33 days

Based on the Figure 5. that was occurring airsacculitis with changes in air sacs in the form of white foam. Accordance with Elanco Animal Health (2010) airsacculitis moderate to the severe potential for secondary bacterial infections or respiratory viruses. It indicates an interruption in the respiratory system that causes airsacculitis within the chest cavity.

The airbag is a cavity with thin and delicate walls. However, if the airbag infection occurs, it will usually have thickening and inflammation (airsacculitis), so it is easy or can be detected during the necropsy chicken (Ralph Say, 1987). According to Tabbu (2000) If the IBD virus affecting chickens aged 3 weeks and over, usually arise IBD clinical forms, namely immunosuppressive effects like air sac infection, vaccination failure, and immunological suppression.

Figure 6. Hemorrhage in the heart of broiler chickens aged 33 days

(1. Normal Heart, 2. Abnormal Heart, 3. Abnormal Heart, 4. Abnormal Heart)

Based on the Figure 6 shows that the heart 1 in normal conditions (in terms of shape and color is normal), the heart of the 2 and 3 experienced hemorrhage and abnormal size (hypertrophy), 4 had a hemorrhage and cardiac abnormalities size (atrophy). Changes to the heart are made possible by a secondary infection. According to Tabbu (2000), infected chickens IBD most widely followed by secondary infection with ND, CRD, colibacillosis. Based on the observation of clinical symptoms and results of a necropsy performed at stall 2 Arjasari indicating an IBD. It can be concluded that there are cases of IBD in broilers PT. Aretha Nusantara Farm at the age of 17-33 days.

Conclusion

Based on the research that has been done in PT. Aretha Nusantara Farm can be concluded as follows:

1. The field diagnosis method for Infectious Bursal Disease incidence is made with a view of the clinical symptoms, the mortality rate, and a necropsy.
2. Necropsy can be used as a support to strengthen the diagnosis of clinical symptoms of Infectious Bursal Disease mainly changes or damage to the bursa of fabricius.

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